

## DISCUSS THE IDEAS

### **SIDNEY CROSBY, HOCKEY PLAYER**

At the 2010 Olympic Winter Games in Vancouver, British Columbia, Sidney Crosby of Cole Harbour, Nova Scotia, scored the gold medal-winning goal in men's hockey. Team Canada, which had been playing at a furious pace against the United States, won the game with a score of 3 to 2.

In the 2001-2002 season, when Crosby was playing for the Dartmouth Subways, he scored 95 goals and earned 193 points in 74 games. How would you calculate the average number of points he earned per game?



$$\frac{193 \text{ pts}}{74 \text{ gm}} = 2.61 \text{ pts/gm}$$



## What is a Rate?

**Rates** – similar to a ratio but compares two numbers with different units.

**Examples:**

- the number of words you can type per minute
- the number of hamburgers a concession stand sells

each day

- the price of lumber per linear foot
- the speed at which you run

**Words/minutes**

**Km/h**

**\$/ft**

### Example 1

If halibut steaks cost \$2.49 for 100 g, how much will it cost to buy 250 g of halibut steaks?

#### Method 1

$$\frac{\$2.49}{100 \text{ g}} = \frac{x}{250 \text{ g}}$$

$$100 \times 250 = 25\,000$$

$$(25\,000) \frac{\$2.49}{100 \text{ g}} = (25\,000) \frac{x}{250 \text{ g}}$$

$$\$622.5 = 100x$$

$$x = \$6.23 \text{ for } 250 \text{ g of halibut.}$$

#### Method 2

$$\frac{\$2.49}{100 \text{ g}} \begin{matrix} (x \ 2.5) \\ (x \ 2.5) \end{matrix} = \frac{x}{250 \text{ g}}$$

$$x = \$6.23$$

### Your Turn

A local plumbing store sells 100 copper-plated pipe straps for \$4.97. You have estimated that you require 75 straps.

How much will you pay for 75 straps?

$$\frac{\$4.97}{100} = \frac{x}{75}$$

$$100 \times 75 = 7500$$

$$(7500) \frac{\$4.97}{100} = (7500) \frac{x}{75}$$

$$\$372.75 = 100x$$

$$x = \$3.73 \text{ for } 75 \text{ straps}$$

## HINTS

1. Make sure you are comparing the same unit or units when you set up a proportion.
  2. To find a common denominator, you can multiply the given denominators. In the example, 7500 is obtained by multiplying 100 and 75.
- Are there other common denominators that could have been used?
  - How would the choice of 750 as a common denominator affect your calculations?
  - The lowest common denominator is the smallest number that all given denominators will divide into evenly.

### ACTIVITY 1.2 FRUIT DRINK TASTE TESTER

You are part of a taste tester team for a healthy lifestyle company. Your team is developing some new drinks to put on the market. The company has produced orange concentrate that is packaged in 1-cup portions. Buyers will mix the concentrate with water, and the best proportions of concentrate to water need to be identified.

The company is considering two different recipes. It is your team's job to compare the recipes and produce a taste tester report.

### Recipe #1

3 cups of concentrate  
7 cups of water

### Recipe #2

2 cups of concentrate  
5 cups of water

Complete a table like the one below for the company.  
A batch is one recipe.

MIXING THE CONCENTRATES				
	Recipe #1		Recipe #2	
Batches	Orange concentrate (cups)	Water (cups)	Orange concentrate (cups)	Water (cups)
1	3	7	2	5
2	6	14	4	10
3	9	21	6	15
4	12	28	8	20
5	15	35	10	25
6	18	42	12	30
7	21	49	14	35
8	24	56	16	40
9	27	63	18	45
10	30	70	20	50

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- 1)  $3 \times 100 = 300$  cups of orange concentrate.
- 2) If you compare equivalent cups of concentrate from the two batches. Recipe #1 will use less water each time. Therefore recipe #1 has the stronger orange taste.
- 3)  $\frac{2}{5} = \frac{1}{x}$        $x = 2.5$  cups of water.

4) If you look at Recipe #1:

$$\begin{array}{r} 3 \text{ cups of concentrate} \\ + \text{ } \underline{7 \text{ cups of water}} \\ 10 \text{ cups of orange drink} \end{array}$$

For 8 cups of orange drink:

$$\begin{array}{r} \underline{\text{Concentrate}} \\ \frac{3}{10} = \frac{x}{8} \end{array}$$

$$\begin{array}{r} \underline{\text{Water}} \\ 8 - 2.4 = 5.6 \end{array}$$

5.6 cups of water

$$24 = 10x$$

$$x = 2.4 \text{ cups of concentrate.}$$

5) Fruit Drink

$$\begin{array}{r} 2 \text{ cups pineapple} \\ 3 \text{ cups cranberry} \\ + \text{ } \underline{5 \text{ cups apple}} \\ 10 \text{ cups of juice} \end{array}$$

Pineapple

Cranberry

Apple

$$\frac{2}{10} = \frac{x}{4}$$

$$\frac{3}{10} = \frac{x}{4}$$

$$\frac{5}{10} = \frac{x}{4}$$

$10 \times (0.4) = 4$ , therefore we can multiple by 0.4

$$2(0.4) = 0.8$$

$$3(0.4) = 1.2$$

$$5(0.4) = 2$$

**To Do:**

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